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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/735,881	12/16/2003	Andreas Fischer	015290-770	5455

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EXAMINER

ARANCIBIA, MAUREEN GRAMAGLIA

ART UNIT	PAPER NUMBER
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1763

DATE MAILED: 12/01/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/735,881	Applicant(s) FISCHER, ANDREAS	
	Examiner Maureen G. Arancibia	Art Unit 1763	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 September 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) 11-13 and 18-21 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-10 and 14-17 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 16 December 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>01/04</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

1. Applicant's election of Species A, the embodiment of Figure 1, in the reply filed on 6 September 2006 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).
2. Applicant has identified Claims 1-10 and 14-21 as readable on the elected species. However, Claims 18-21 are drawn to non-elected Group II, a method of processing substrates, and have already been withdrawn. Claims 11-13 are further withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected species, there being no allowable generic or linking claim. Election of species was made **without** traverse in the reply filed on 6 September 2006.
3. Claims 1-10 and 14-17 will be examined on the merits.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. **Claims 1-6, 8-10, 14, 15, and 17 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent Application Publication 2002/0159216 to Ennis.**

In regards to Claim 1, Ennis teaches a segmented RF powered electrode apparatus for use in plasma processing (Figures 3 and 4), the apparatus comprising: a

Art Unit: 1763

first electrode 202; a second electrode 204 surrounding the first electrode; a dielectric material 210 interposed between the first electrode and the second electrode (Paragraph 46); at least one dual frequency RF power source 240 adapted to output power at a first frequency 242 and a second frequency 246, wherein the first frequency and the second frequency are different (Paragraph 57); and at least one radio frequency switch 248 adapted to at least route the first frequency or the second frequency from the at least one dual frequency source to the first electrode, the second electrode, or the first and the second electrode (*[if] it is desired for the plasma coupled to different portions of workpiece 54 to have substantially the same energy, microprocessor 30 controls switch array 248 to achieve such a result*) (Paragraphs 57-60).

In regards to Claims 1 and 4, the dielectric material 210 would inherently electrically isolate the first electrode from the second electrode by suppressing radio frequency cross talk between the first and second electrodes, due to its dielectric (electrically insulating) properties. When a rejection is based on inherency, a rejection under 35 U.S.C. 102 or U.S.C. 103 is appropriate. (See *In re Fitzgerald* 205 USPQ 594 or MPEP 2112).

In regards to Claims 2 and 3, the first electrode 202 is a circular inner electrode and the second electrode 204 is a ring shaped outer electrode (Figure 3; Paragraph 46).

In regards to Claims 5 and 6, the radio frequency switch 248 as taught by Ennis meets the limitations as broadly recited in the claims of including a first switching array and a second switching array, the first switching array being adapted to supply the dual frequency power source to the first electrode 202 via an output lead connected to

Art Unit: 1763

variable power gain amplifier 250, and the second switching array being adapted to supply the dual frequency power source to the second electrode 204 via an output lead connected to variable power gain amplifier 252. Each of the first switching array and the second switching array, as part of radio frequency switch 248, meets the limitation as broadly recited in the claim, of having a first switch position, a second switch position, and a third switch position, wherein the first switch position routes the first frequency to the electrode, the second switch position routes the second frequency to the electrode, and the third position routes neither the first nor the second frequency to the electrode.

In other words, the radio frequency switch 248 of Ennis is capable of being configured by controller 20 so as to comprise a first switching array and a second switching array with the features as recited in the claims (see Paragraphs 57-60), and is structurally capable of routing the first and second frequencies in the manner recited in the claims (Paragraphs 57-60). The radio frequency switch 248, as taught by Ennis, meets both the structural and functional limitations recited in Claims 5 and 6. It has been held that claims directed to apparatus must be distinguished from the prior art in terms of structure rather than function. *In re Danly*, 263 F.2d 844, 847, 120 USPQ 528, 531 (CCPA 1959). Also, a claim containing a "recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus" if the prior art apparatus teaches all the structural limitations of the claim. *Ex parte Masham*, 2 USPQ2d 1647 (Bd. Pat. App. & Inter. 1987)

In regards to Claim 8, Ennis teaches a control unit 20 to control the at least one radio frequency switch. (Paragraph 57)

In regards to Claims 9 and 14, Ennis teaches that the segmented RF powered electrode is incorporated in a substrate support 56 in a plasma etching chamber 40, the substrate support supporting a single semiconductor wafer 54, and the substrate support including an electrostatic chuck (*electrodes 202, 204, and 206 electrostatically clamp workpiece 54*) that can be used in the plasma etching chamber. (Figures 1 and 4; Paragraphs 48-50)

In regards to Claim 10, the dual frequency power source 240 taught by Ennis may be considered as a single frequency power source, wherein the radio frequency switch 248 acts as a coupling switch adapted to couple the first frequency and the second frequency into the single frequency power source, as broadly recited in the claim, which can then be supplied to the first and second electrodes 202, 204. (Paragraphs 57-60) The radio frequency switch 248, as taught by Ennis, meets both the structural and functional limitations of the coupling switch as recited in Claim 10. It has been held that claims directed to apparatus must be distinguished from the prior art in terms of structure rather than function. *In re Danly*, 263 F.2d 844, 847, 120 USPQ 528, 531 (CCPA 1959). Also, a claim containing a "recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus" if the prior art apparatus teaches all the structural limitations of the claim. *Ex parte Masham*, 2 USPQ2d 1647 (Bd. Pat. App. & Inter. 1987)

In regards to Claim 15, see the discussion of Claim 5.

In regards to Claim 17, see the discussion of Claim 8.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 7 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ennis in view of U.S. Patent Application Publication 2005/0061445 to Koshiishi.

The teachings of Ennis were discussed above.

In regards to Claims 7 and 16, Ennis teaches that the dual frequency RF power source can have a 27.1 MHz RF generator 246 and a 4 MHz RF generator 242. Ennis does not expressly teach that the dual frequency RF power source has a 27 MHz RF generator and a 2 MHz RF generator.

Koshiishi et al. teaches that an RF power signal with a frequency of 27 MHz or higher (which range includes the claimed frequency of 27 MHz) can be supplied to a plasma generating electrode 21 in a plasma chamber. (Paragraph 73) Koshiishi et al. also teaches an RF power signal with a frequency of 2 MHz can be supplied to a substrate supporting electrode 5 in a plasma chamber. (Paragraph 72)

It would have been obvious to one of ordinary skill in the art to modify the apparatus taught by Ennis to have a 27 MHz RF generator and a 2 MHz RF generator,

as taught by Koshiishi et al. The motivation for having a 27 MHz RF generator, as taught by Koshiishi et al. (Paragraph 73), would have been that RF power of this frequency is desirable for increasing the plasma density. The motivation for having a 2 MHz RF generator, as taught by Koshiishi et al. (Paragraph 72), would have been that RF power of this frequency helps improve the anisotropic property of etching performed with the plasma.

Conclusion

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Maureen G. Arancibia whose telephone number is (571) 272-1219. The examiner can normally be reached on core hours of 10-5, Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parviz Hassanzadeh can be reached on (571) 272-1435. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 1763

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



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